

CANINE PRACTICE — GENETICS

A 5-month-old male mixed-breed dog with two penises and a third, rudimentary rear limb which was attached by a hemipelvis was presented. One month after it was adopted from an animal shelter, the dog developed a gross hematuria and inappropriate urination. Several years later, the owners requested the dog be castrated. Ultrasonography reconfirmed the presence of two normal kidneys, a right and left bladder, and two prostate glands. Conclusions of the studies indicate that while the embryologic basis for development of these anomalies is not well understood, they need not be incompatible with life.

A CASE REPORT

Diphallia and Polymelia in a Dog

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Introduction

Diphallia, or duplication of the penis, is a rare anomaly that has been reported in cattle, sheep, horses, dogs, and man.¹⁻⁹ The majority of reports are from the human literature. Two dogs with this condition have been reported.^{5,6}

Polymelia, or presence of supernumerary limbs, also has been reported in several species, including cattle, sheep, pigs, rabbits, and rats.^{3,10-13}

The dog discussed here is extremely unusual in that he has both anomalies. There has been one report in the veterinary literature of a sheep with diphallia and polymelia³ and one undocumented case in the human literature of "diphallia with three legs."⁷

We report a description of the physical findings of a dog with diphallia and polymelia.

Case Presentation

A 5-month-old male mixed-breed dog was presented to an animal shelter for adoption due to the presence of two penises and a third, rudimentary rear limb which was attached by a hemipelvis to the right side of the tail head (Figs. 1 & 2). The sire, dam, and littermates were all phenotypically normal. The extraneous rear limb was amputated at the shelter.

Two months later, the dog was adopted and presented to one of the authors (Saul A. Zucker, DVM) for removal of the sutures remaining after the amputation from the granulating wound on the right side of the tail head. The dog had two complete prepuces and penises. There were two scrotal sacs, one on each side, each containing one tes-

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FIG. 1 —
Mixed-breed dog
with polymelia.
Note extraneous
rear limb
originating
beneath tail.



FIG. 2 — Lateral
radiograph
demonstrating
hemipelvis caudal
to normal pelvis
and bones of extra
limb.

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FIG. 3 —
Duplication of
prepuce in
mixed-breed dog
with diphallia.

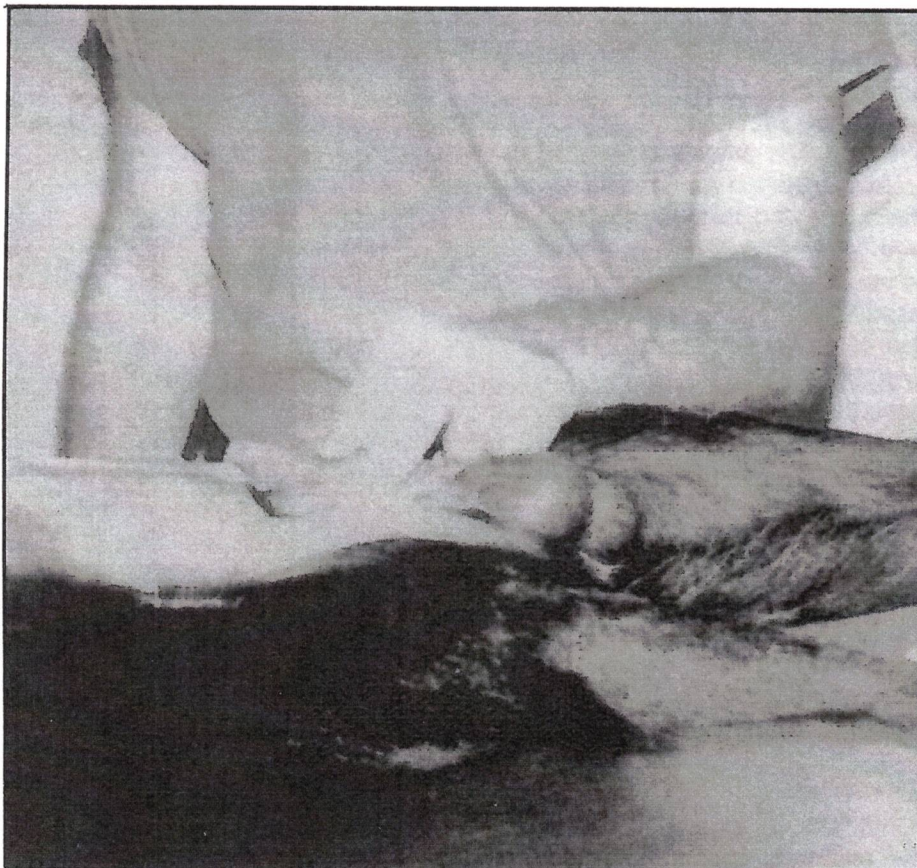


FIG. 4 — Mixed-
breed dog with
diphallia. The two
penises are
extruded. Note the
two separate
scrotal sacs, each
containing one
testicle.

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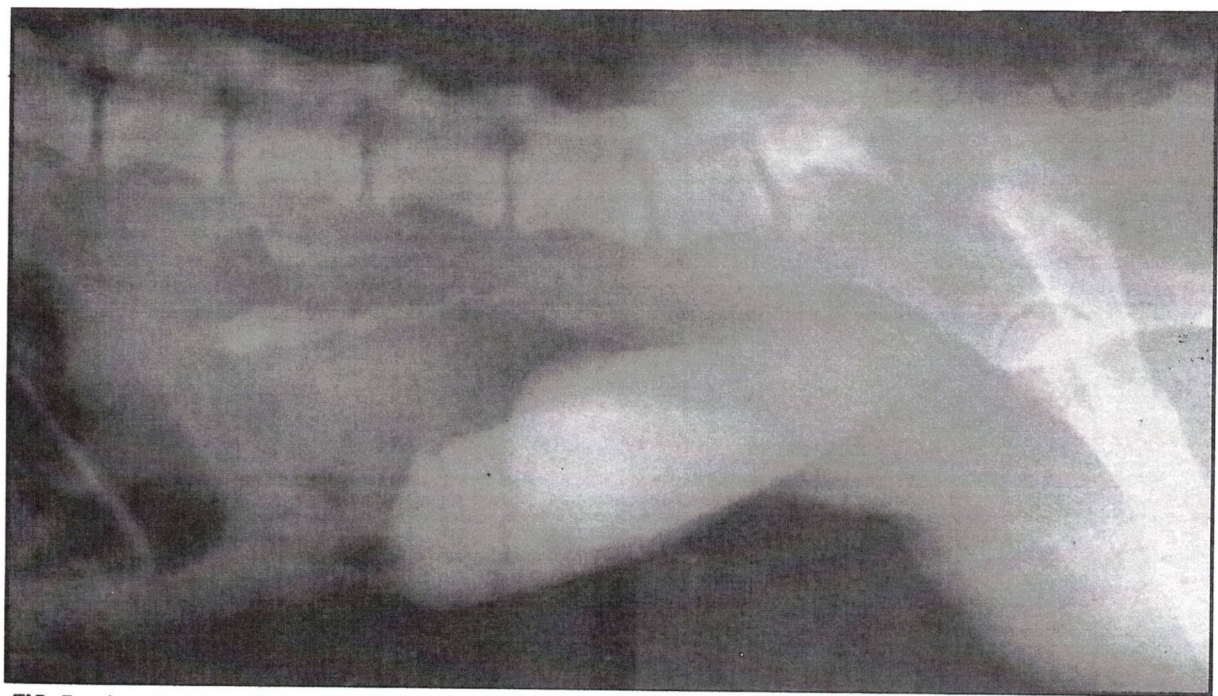


FIG. 5 — Intravenous urogram and retrograde cystourethrogram of dog with diphallia: lateral view. Note ureteral dilatation on right.

ticle (Figs. 3 & 4). The owners reported observing urination from both penises.

The dog presented one month later with a 2-day history of gross hematuria and inappropriate urination. The physical examination revealed no abnormal findings apart from the diphallia detected earlier. A serum chemistry profile, complete blood count (CBC), and urinalysis were performed. Abnormalities noted included proteinuria, pyuria, hematuria, and a leukocytosis.

An intravenous urogram and retrograde urethrocytogram were performed (Figs. 5 & 6). The kidneys appeared normal. The left ureter was normal in size; mild ureteral dilatation was present on the right. The ureters emptied into two distinct bladders which were drained by the two penile urethras. As there were no anatomic abnormalities suggesting an underlying cause for the cystitis, treatment consisted of oral antibiotics only. The dog responded favorably.

Several years later, the owners requested that the dog be castrated. Abdominal ultrasound was performed prior to surgery to look for the presence of supernumerary undescended testicles, if any. Ultrasonography reconfirmed the presence of two normal kidneys. No ureteral dilatation was evident, and the right bladder was smaller than the left. Two prostate glands were present, and the right prostate was enlarged. Bilateral densities suggestive of two retained testicles were present.

CASTRATION

Castration and an exploratory laparotomy were performed one month later. The descended testicles were removed routinely. At laparotomy, the

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FIG. 6 — Intravenous urogram and retrograde cystourethrogram of dog with diphallia: ventral dorsal projection. Note ureteral dilatation on right.



right prostate was observed to be markedly enlarged. No testicular tissue was found in the abdomen. A piece of fascia was removed for fibroblast culture and karyotype, which was normal, (78XY). The dog was placed on systemic antibiotics for prostatitis and responded well.

Discussion

Diphallia and polymelia arise secondary to developmental defects early in embryogenesis. Both diphallia and polymelia commonly present with other abnormalities, such as duplication of other organs or aplasia/hypoplasia of other organ systems. The pathogenesis of these processes could be explained in two ways:

- Embryologic tissues that should fuse do not, allowing for development of identical sets of tissues.^{7,8} This theory would explain the prevalence of other anomalies occurring along with diphallia and polymelia. An abnormality of a very early embryologic tissue would affect more than one system, as many systems such as the genital and urinary systems are embryologically and anatomically interwoven in their development.²
- Fission of the original embryonic mass may take place prior to formation of the blastocyst, leading to formation of identical twins from one fertilized egg.¹⁴ The duplicate portions of the individual showing these anomalies may in fact be the remnants of a conjoined twin.¹⁵

Conclusion

A case of diphallia and polymelia in the dog is presented. While the embryologic basis for devel-

opment of these anomalies is not well understood, they need not be incompatible with life. ■

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